

**Remarks**

The above Amendments and these Remarks are in reply to the Office action mailed January 13, 2004. No fee is due for the addition of any new claims. An appropriate Petition for Extension of Time to Respond is submitted herewith, together with the appropriate fee.

Claims 17-44 were pending in the Application prior to the outstanding Office Action. In the Office Action, the Examiner again rejected all claims. The present Response makes no changes to the claims, leaving for the Examiner's present consideration claims 17-44. Reconsideration of the rejections is requested.

**I. THE REJECTIONS**

The Examiner again rejected all claims as being anticipated by Lamping '632.

Applicants will discuss the rejections in claim number sequence. The remarks made herein are made without prejudice to those made by Applicants in the previous Responses in the present application and its predecessors, all of which are incorporated by reference herein to the extent they continue to apply.

**A. Independent Claim 17**

Claim 17 calls for:

17. A method of laying out a node-link structure in a space with negative curvature; the method comprising:

obtaining nearby relationship data for a subject element in the structure, the nearby relationship data indicating information about nearby node-link relationships, the nearby relationship data excluding

relationships with at least one element of the node-link structure; and

based on only the nearby relationship data, and not on the position of any other element in the structure, obtaining layout data identifying the subject element's position in the space with negative curvature.

Thus claims 17 calls for a step of obtaining *nearby* relationship data for a subject element.

The *nearby* relationship data is typically limited to relationships with elements only a short distance from the subject element in the node-link structure (see specification examples), but even if not, the claim specifically says that they *cannot* include *all* elements of the node-link structure ("the nearby relationship data excluding relationships with at least one element of the node-link structure").

Claim 17 then calls for a step of obtaining layout data identifying the subject element's position in a space with negative curvature. The layout data has to be based only on "the" nearby relationship data (i.e. the nearby relationship data obtained in the step of obtaining), and therefore there must be at least one element of the node-link structure whose relationship with the subject element is *not* used in determining the layout data.

Lamping '632 does not teach this feature at all.

In Lamping '632, the layout method in layout space (the space with negative curvature) always starts with the root node of the node-link structure, and always lays out the *entire* node-link structure, and always uses the relationship of *all* elements of the node-link structure in obtaining *each* element's position in layout space. See Lamping '632, Fig. 9 and col. 20, line 18 - col. 21, line 8. Lamping's layout routine is always called beginning at the root node (see step

350), and does not stop until it reaches all the way down to nodes that have no more children (step 360). For *each* element of the node-link structure which is to be laid out, the nearby relationship data for *all* other elements of the node-link structure are taken into account. There is no "at least one element" of the node-link structure whose relationship with the subject element is *not* used in determining the layout data.

If Applicants understand the Examiner correctly, she cites Lamping '632, Figs. 6-7 and col. 17, line 20 - col. 18, line 50, for the proposition that the nearby relationship data used by Lamping to obtain layout data excludes relationships with at least one element of the node-link structure. **But Lamping '632, Figs. 6-7 and col. 17, line 20 - col. 18, line 50 describe a method of mapping layout data *from* layout space to a circular *display region*.** The layout space is a space with negative curvature, *but a display region is a flat space*.

Applicants already pointed this out in their Response B, at pp. 7-8.<sup>1</sup>

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<sup>1</sup>It occurs to Applicants, upon re-reading the beginning of the Examiner's rejection of claim 17, that the Examiner may not fully appreciate the mathematical concept of a space with negative curvature. In order to make sure the Examiner has a full understanding of this concept, Applicants are attaching hereto a short and simplistic explanation of the concept from a University course web page. See "Space Properties", pp. 1-6 (2002), available at [http://scholar.uwinnipeg.ca/courses/38/4500.6-001/Cosmology/Properties\\_of\\_Space.pdf](http://scholar.uwinnipeg.ca/courses/38/4500.6-001/Cosmology/Properties_of_Space.pdf), visited 6/4/2004, copy attached. As can be seen, the concept of parallel lines diverging, in a space with negative curvature, means that in the particular "space", lines that look parallel on a small scale eventually diverge when viewed on a larger scale. The diverging occurs not because the lines are curved on the surface, but because the surface itself is curved.

The Examiner may consider Lamping '632, Figs 15-17, as showing that display space is a space with negative curvature. But what is shown in these drawings is a flat surface (e.g. a computer monitor) on which curved lines (arcs) have been drawn connecting parent nodes to child nodes. Thus the images show *intersecting* lines that diverge - which happens all the time in *flat* spaces. The images do not show any *parallel* lines that diverge.

Therefore the method cited by the Examiner:

(1) is not a method of laying out a node-link structure in a space with negative curvature, and

(2) never performs any step of "obtaining layout data identifying the subject element's position in the space with negative curvature", based on any relationship data, as called for in Applicants' claim 17.

The Examiner is correct that in Lamping's process of transforming element positions *from* layout space *to flat mapping space*, Lamping does avoid transforming elements that are too near the edge of the unit disk (Fig. 6, step 262). But no such exclusion is made in Lamping's process of laying out elements of the node-link structure *into* the space with negative curvature. In Lamping '632, the nearby relationship data of *all* elements of the node-link structure are used in obtaining *each* element's position in layout space.

As set forth in Applicants' Response C and repeated in Response D, therefore, Applicants respectfully submit that the Examiner has not made a prima facie case that claim 17 is unpatentable.

#### **B. Dependent Claims 18-25**

The Examiner rejected claims 18-25 in previous Office actions as being anticipated by Lamping '632. Applicants have already provided numerous points explaining why claims 18-25 should be patentable in their own right. See Applicants' Response C, pp. 19-21. Again, however,

neither the new Office action nor the previous one appear to address any of Applicants' points. They merely repeat the first-made rejection.

In light of this, Applicants once again submit that each of the dependent claims 18-25 should be patentable since the Examiner has not made a prima facie case of unpatentability.

**C. Independent Claims 26-28**

The Examiner has not indicated a reason in the outstanding Office action for her rejection of independent claim 28. However, claims 26-28 all contain limitations similar to those in independent claim 17. These claims should all be patentable for many of the same reasons as set forth above and previously with respect to claim 17. These claims also add their own limitations which, it is submitted, render them patentable in their own right.

It is respectfully submitted, therefore, that these claims should be patentable because the Examiner has not made a prima facie case of unpatentability.

**D. Independent Claim 29**

Claim 29 calls for:

29. A method of laying out a plurality of elements of a node-link structure in a space with negative curvature, the method comprising:

obtaining nearby relationship data for each element in the plurality, the nearby relationship data indicating information about nearby node-link relationships;

based on the nearby relationship data for each element in the plurality, calculating element's position in the space with negative curvature; and

storing the positions for each element in the plurality in a data structure such that after the positions for all elements in the plurality have been calculated, the position of each element in the plurality is stored in the data structure only relative to an element of the node-link structure other than a root element of the node-link structure.

As with claim 17, at a minimum claim 29 calls for a step of calculating an element's position in a space with negative curvature.

But again, the Examiner cites only parts of Lamping '632 that have to do with a method for mapping from layout space to a circular display region, which is flat, and is not a space with negative curvature.

Primarily, at the top of p. 5 of the outstanding Office action, the Examiner cites Lamping's Fig. 13 and the description at col. 23, line 56 - col. 24, line 65. But Fig. 13 begins *after* step 304 of his Fig. 8, which is the step in which the transformation is made from node-link data to layout data. See the very beginning of Fig. 13: "FROM BOX 304, ...." In Fig. 13, the procedure described has to do with mapping *from* the layout data to the *flat unit disk* for eventual display. See step 500 at the beginning of Fig. 13: "Receive call for *mapping* handle of root node." See also the beginning of the description at col. 23, lines 38-40: "Fig. 13 shows acts in *using* layout data *from* box 304 in Fig. 8 to present a representation of a node-link structure, as in boxes 306, 326, and 336 in Fig. 8." Boxes 306, 326, and 336 in Fig. 8 are all steps for *mapping* and *presenting* representations of the structure on a display or printout.

Applicants already pointed this out in their Response C, once at pp. 16 and again at p. 20.

Thus as with independent claim 17, the Examiner has cited nothing in Lamping '632 that teaches *anything* about calculating positions in a space with negative curvature, only excerpts about obtaining *mapped* positions on the unit disk, which is *flat*, not a space with negative curvature.

Accordingly, Applicants repeat their assertion that the Examiner has not made a prima facie case of unpatentability of claim 29.

**E. Dependent Claims 30-41**

Claims 30-41 all depend ultimately from independent claim 29. These claims should all be allowable because of their dependency from independent claim 29. These claims also each add their own limitations which, it is submitted, render them patentable in their own right.

As pointed out in Applicants' Response D, several of these dependent claims are similar to former claims 2-12. The Examiner rejected those claims 2-12 in a previous Office action as being anticipated by Lamping '632. In Response C, Applicants provided numerous points explaining why these claims should be patentable in their own right. But neither the Office action following Response C, nor the presently outstanding Office action, appear to address any of Applicants' points.

For example, without limitation, **claim 31** adds a limitation that the position of each particular element as represented in the data structure after the positions for all elements in the plurality have been calculated, include:

position displacement data indicating a distance between the particular element and a parent of the particular element,

and

angle displacement data indicating an angular difference between an incoming link to the parent of the particular element and an outgoing link from the parent to the particular element.

Nowhere does Lamping '632 teach such features. At a minimum, as described in detail in Applicants' Response C, the position in Lamping '632 specifies *angle* information only relative to a predetermined and fixed "zero direction". Lamping '250, col. 23, lines 64-65, referenced in Lamping '632. He certainly neither teaches nor suggests representing layout data using "angle displacement data indicating an angular difference between an incoming link to the parent of the particular element and an outgoing link from the parent to the particular element" as called for in Applicants' claim 31. The angles of incoming and outgoing links for parent nodes in layout space are not even mentioned in Lamping '632.

In the outstanding office action, the Examiner cites Lamping col. 23-24 and Fig. 13 as disclosing "the radii and angles for the set of children to obtain a position displacement and an angle displacement between the parent and the element." But again, the cited text of Lamping concerns node positions in the flat display space, not in the space with negative curvature as required by parent claim 29.

**Claim 32** depends from claim 31 and adds the further limitation that the position as represented in the data structure include *only* the position displacement data and the angle displacement data. Again, Lamping '632 does not teach this limitation.



In the outstanding office action, the Examiner again cites Lamping col. 23-24 and Fig. 13 as teaching this limitation. But again, the cited text of Lamping concerns node positions in the flat display space, not in the space with negative curvature as required by parent claim 29.

**Claim 33** calls for the step of obtaining nearby relationship data to include a step of obtaining a count of grandchildren for each of a set of children of the parent. Nothing in Lamping '632 teaches this feature. Nor does the Examiner in the office action make any attempt to identify it, except to point to col. 25, lines 24-50 and Fig. 13, which again concerns node positions in the flat display space, not in the space with negative curvature as required by parent claim 29.

**Claim 34** depends from claim 33 and adds limitations that the counts of grandchildren be used to obtain radii and angles, and that position displacement and angle displacement between the parent and the element be obtained using the radii and angles. Again, Lamping '632 neither teaches nor suggests this feature. Nor does the Examiner in the office action make any attempt to identify it, except to point again to Lamping, col. 25, lines 24-50 and Fig. 13, which again concerns node positions in the flat display space, not in the space with negative curvature as required by parent claim 29.

**Claim 35** depends from claim 34 and adds a limitation calling for a comparison to be made between the obtained angle displacement and the previous angle displacement to determine whether to lay out children of the element. Again, Lamping '632 nowhere teaches this element, and the part of Lamping '632 cited by the Examiner is not a method of laying out a node-link structure in a space with negative curvature.

**Claim 36** depends from claim 30 and adds a limitation calling for the nearby node-link relationships, based on which the element's position relative to a parent in the space with negative curvature is to be obtained, include *only* relationships among the parent and the parent's children and grandchildren. The nearby node-link relationships therefore do not include any ancestors of the element's parent element. Not only is this feature not taught in Lamping '632, but it is *contrary* to Lamping '632, in which the node-link structure is taught as being laid out beginning at the *root* node. Nor do the parts of Lamping '632 identified by the Examiner teach the claimed features.

Accordingly, it is respectfully submitted that each of the dependent claims 30-41 should be patentable since the Examiner has not made a prima facie case of unpatentability.

**F. Independent Claims 42-44**

Claims 42-44 all contain limitations similar to those in independent claim 29. These claims should all be patentable for many of the same reasons as set forth above and previously with respect to claim 29. These claims also add their own limitations which, it is submitted, render them patentable in their own right.

It is respectfully submitted, therefore, that these claims should be patentable because the Examiner has not made a prima facie case of unpatentability.

## II. CONCLUSION AND OTHER MATTERS

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested.

The Examiner is respectfully requested to telephone the undersigned before yet another rejection is issued, on the chance that verbal communication might help avoid the necessity for an appeal.

Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for extending the time to respond up to and including July 13, 2004.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-0869 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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attachment: "Space Properties", pp. 1-6